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ABSTRACT

The Peterson-Yaakobi Q-Sorts (PYQS) were developed to provide a simple, effective, easily scored self-concept test which is role specific, is an alternative to paper-pencil inventories or questionnaires, and does not require external inference of norms. This manual describes two double Q-sorts. This first PYQS is for classroom and student teachers in public schools, and the second is for secondary school science students. A double Q-sort is one in which two sets of items are sorted on different criteria, followed by a comparison of the ordering between the sets. The PYQS use behavior statements printed on computer cards, which enables the completed sorts to be computer read, scored and analyzed quickly. Directions for administering, scoring, and interpreting the Q-sorts are included. Self-concept scores are indicated by the correlation coefficient calculated between the ideal and actual sorts. The measures are derived from rankings of statements which describe actual behavior. Sort items and computer program printouts are appended. (Author/JAC)

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PETERSON-YAAKOBI Q-SORT MANUAL

TM007 488

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Kenneth Peterson
Duba Yaakobi
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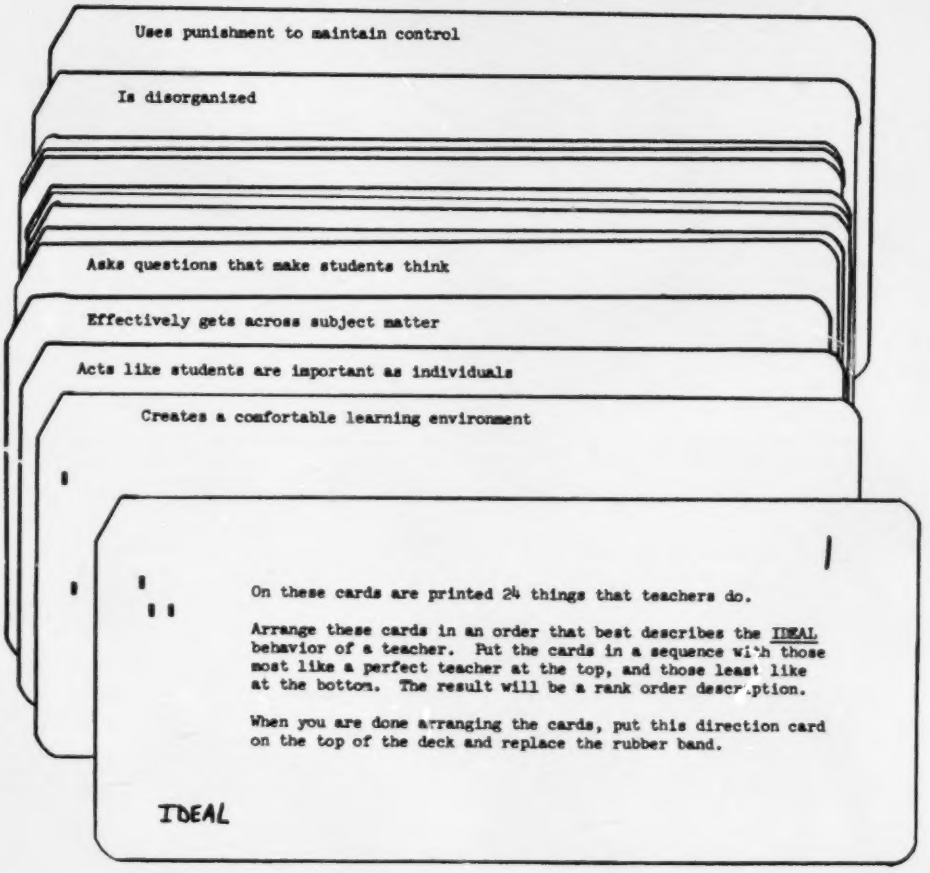
1978

The Peterson-Yaakobi Q-Sorts (PYQS) are assessment instruments which give an index of role specific self-concept, and which yield profiles of perceptions of ideal and actual behavior in these roles. These measures are derived from double Q-sorts, i.e., rankings of ideal behavior statements, and then rankings of statements which describe actual behavior. The indicator of self-concept is a rank order correlation coefficient between the two sorts: how willing is the subject to describe his/her own actual behavior in terms of his/her own ideal behavioral profile. A list of the behaviors, as ranked by the subject (or group of subjects), describes priorities or values of the perception of both ideal behavior and actual behavior in the role described in the sort.

The PYQS use behavior statements printed on computer cards, which enables the completed sorts to be computer read, scored and analyzed in a brief time. Following the computer reading, the sort cards are available for use with another group of subjects.


Uses punishment to maintain control
Is disorganized
Asks questions that make students think
Effectively gets across subject matter
Acts like students are important as individuals
Creates a comfortable learning environment
On these cards are printed 24 things that teachers do.
Arrange these cards in an order that best describes the IDEAL behavior of a teacher. Put the cards in a sequence with those most like a perfect teacher at the top, and those least like at the bottom. The result will be a rank order description.
When you are done arranging the cards, put this direction card on the top of the deck and replace the rubber band.
IDEAL

This manual describes two double Q-sorts. The first is for classroom teachers and student teachers in public schools. The second is for secondary science students. The procedures presented in this manual can be adapted for other groups by changing the behavioral items.

The PYQS enable assessment of individual self-concept as a teacher or science student. Comparative measures, such as pre- and post-treatment (training), or between classes or groups, indicate changes in subjects over time, or other group differences. Mixed administrations (e.g., teacher sort given to students) assess how one group perceives the ideal and actual behavior of the other groups. Such comparisons describe the degree of consonance or dissonance of perception between, for example, teacher-pupils, master teacher-student teacher, teacher educators-student teachers, elementary teachers-secondary teachers, administrators-teachers, or teacher-parents. The comparative measures are made simply as a correlation between group composite sorts, or in more detail with a significance test of mean ranks of each item.

The PYQS procedures were designed for easy alteration by other researchers. Custom sets of behaviors (e.g., social studies student or teacher's aide) can be written and processed with the same computer programs. The number of items in a sort also can be easily changed.

Purpose

The PYQS were developed to provide a simple, effective, easily scored self-concept assessment instrument which is role-specific, an alternative to paper-pencil inventories or questionnaires, and which does not require external inference or norms. In addition, an instrument was sought which provides data about perceptions of behavior for use of teachers and researchers. Such an instrument can also have value in program evaluation, where self-concept is an objective or significant byproduct.

Background

Self-concept, self-esteem or self-worth have long been regarded as important dimensions of school life and work. They have taken place along with educational achievement, ordered intellectual power, a developed imagination, and relations with other people as major goals of the school experience. Of course, in any given situation one or more of these dimensions may assume major importance as an objective but the others remain as factors of overall success. Each emphasis seems to have its champions which claim priority. There is disagreement as to whether one or

more of these dimensions are byproducts of others. However, it is generally agreed that a marked lack of any one of these dimensions can seriously hamper the development of the others.

Three recent books which describe the role and importance of self-concept for students and teachers are Coopersmith's The Antecedents of Self-Esteem (1967), Covington and Beery's Self-Worth and School Learning (1976), and Purkey's Inviting School Success (1978).* These works well describe viewpoints as to the origins, dynamics and interactions of self-concept among students and teachers.

Many other authors have contributed to knowledge about self-concept in school settings. Combs (1965) stated that the "...seeing of self represents the most important single influence affecting an individual's behavior." He extended the notion of self-concept for teachers with the idea of the self as an instrument in teaching. He also pointed to the importance of the self-worthy teacher as an adult model. Coopersmith (1959) discussed a study in which he found a relationship between self-esteem and the subjects (a) ability to tolerate failure, and (b) motivation and striving to overcome its affects. Ziller, et. al. (1969) emphasized the social context of self-concept, which they defined as "a component of the self system which regulates the extent to which the self system is maintained under conditions of strain." Thompson (1972) discussed the importance of self-concept as it affects overall performance in teaching, concluding that it is indeed a significant component. Schultz and Wolf (1973) described the important function of self-concept for the teacher in his or her role of "helping person" (Carl Rogers). They found a relationship between a teacher's self esteem and his or her effectiveness as a facilitator of interpersonal relations. Garvey (1970) explored self-concept as a predictor of future teaching success. She stated that "success in student teaching is affected, but not necessarily determined, by a positive view of oneself, lack of confusion in self-perception, and good adjustment." She suggested that knowledge of self-concept level may assist teacher trainers to help teachers as professional workers. These studies, and related ones (Fink, 1962; Aspy, 1975; Combs, 1958; Purkey, 1970; Epstein and McPartland 1976) suggest the importance of the self-concept construct not only with students, but also for teacher education.

Bilby, et. al. (1972), contributed a useful notion about self-concept with the idea of "role specificity." They stated that certain sources of self-concept, e.g., a work role, contribute to the overall sense with some independence. These authors suggest the utility of defining self-concept in terms limited to role behaviors such as those of being a student or a teacher.

*Contains an up-to-date and thorough bibliography

Self-concept assessment

The level of self-concept is not an immediately demonstrable personal characteristic, thus, for measurement purposes it must be inferred (Combs, 1958). Self-concept assessment is subject of various interpretations and other sources of imprecision. Lee (1972), Diggory (1966), Combs, et. al. (1963), and Ziller (1969) all reviewed the considerations and difficulties of self-concept measurement. They commented on a variety of problems including faking, observer inference, reliability, item interpretation, stability, and observer context. They concluded that self-concept can be usefully measured, it is a fairly constant personal attribute, and there are a variety of effective assessment strategies. They also suggested that assessment systems must be carefully and specifically designed to avoid measurement problems.

A variety of strategies have been used for self-concept measurement. Fitt's Tennesee Self-Concept Scale (1965) has been a frequently used instrument for teacher self-concept investigations (Diggory, 1966; Thompson, 1972). According to Leake (1970) "while many crucial validity relevant issues remain unresolved...its (TSCS) validity rests upon a broader base of positive findings than any other self-concept instrument presently available." Pizzini (1976) agreed with this analysis in making the TSCS his tests of choice in a study with college sophomores. Schultz and Wolf (1973) used a type of double Q-sort with teachers and experts. Additional instruments have been developed for subjects other than teachers. These include the Coopersmith Self-Esteem Inventory (1967) which consists of 58 items which the respondee answers "like me" or "unlike me". The Coopersmith SEI was specifically designed for school-aged children and adolescents; it enjoys a high level of usage. Another instrument, by Soares and Soares, contains 20 bipolar self descriptions on a four point scale, e.g., "I am happy most of the time --I am not happy." The Ziller Test (1969) is a projective instrument in which the subject positions six circles in an arrangement representative of his or her personal relationships.

Q Technique

Q technique refers to a type of psychological assessment described by Stephenson (1953). Q-sorts essentially are procedures for ordering given statements or objects relative to a given criterion, although many variations of the basic technique have been used (Kerlinger, 1964). A double Q-sort is one in which two sets of items are sorted on different criteria, followed by a comparison of the ordering between the sets.

Q-sorts have been extensively used in measures of teacher related constructs

(Gooding, 1971; Stone, 1971) and in assessments of self-worth (Engel, 1959; Kerlinger, 1964; Lee, 1972; Schultz, 1973). Stone and Green (1971) asked student nurses to rank statements about a nursing education curriculum, first as to what an ideal program should be, and then as the participants perceived the actual program to be. A correlation of the rank orders of the items in the two sorts provided in indication of discrepancy between the two descriptive profiles. Gooding and Wilbur (1971) reported the value of single Q-sorts in measuring a variety of teacher attitudes. Schultz and Wolf (1973) described a double Q-sort for teachers which used a Tyler Sort (Tyler, 1964), a 75 item instrument pertaining to therapeutic relationships. The rank order of this sort was correlated with the ideal sort reported by Tyler (made by ten educators and one physician). Engel (1959) reported used a paper-pencil single Q-sort for adolescent self-concept assessment which had 100 items for group ordering, and comparison with an expert sort.

Lee (1972) used a double Q-sort with high school students as a measure of student role self-concept. In this measure 20 students behaviors were sorted to describe an ideal student and actual student. This instrument is a model for the PYQS.

ADMINISTRATION OF THE PETERSON-YAAKOBI Q-SORTS

The ideal and actual sorts are given to the subjects at the same administration. The sorting requires some table space; an individual student desk should be adequate. These steps should be followed:

1. Read the directions printed on the decks. Answer questions about procedures. Emphasize top to bottom rank order. Caution about bent cards.
2. If an item is not understood, it should be placed in the middle of the deck.
3. Begin the sort of the ideal deck. Note the subject number, this same number should also be used for the actual sort.
4. Collect the ideal deck. Check to see that the direction card is on top.
5. Allow a few minutes of diversion before the next sort.
6. Begin the actual sort, with corresponding deck numbers.
7. Collect the actual decks.

Adminstration time takes approximately 15 minutes for both forms of the sort, including direction giving. We have found that teachers use slightly more time than do the students. Typical time for students is 11 minutes, 15 for teachers.

Have additional rubber bands on hand. Shuffle the card decks after scoring.

SCORING

Scoring for the Q-sort decks is done with computer programs, including significance testing with a Statistical Package for the Social Science (SPSS)* program.

Following the administration the decks are readied for a card reader by removing rubber bands, sequencing decks in numerical subject order, and alternating ideal and actual sorts, by subject. Four separate computer programs are used to complete scoring and data analysis:

- #1: reads decks and produces punched data cards,
- #2: calculates correlation coefficients between each subject's set of sorts, and prints group profiles (composites) of ideal and actual behavior,
- #3: rearranges data by item statement, and
- #4: performs significance tests on item mean rank differences among various groups.

These programs are listed in Appendices 3-6 of this manual.

After the first program the card decks are shuffled and readied for reuse.

INTERPRETATION

SELF-CONCEPT scores are indicated by the correlation coefficient calculated

*Nie, et. al., 2nd ed., Mc Graw Hill

between the ideal and actual sorts.

GROUP SCORES include mean correlation (Spearman's rho) and standard deviation, group profile (composite sort) for both ideal and actual behavior.

COMPARISON AMONG GROUPS includes correlation coefficients between sorts (ideal-ideal, actual-actual), and significance testing of items between or among groups.

Computer program #2 reports self-concept scores, mean group scores and composite group profiles. Its interpretation is discussed below in detail. Program #4 reports significance test, by item, among up to 10 groups. Its interpretation follows that of program #2.

Programs for each of these four steps are presented in Appendices 3-6

PROGRAM #2: Calculate Correlations between Actual and Ideal Sorts, Print a group Profile (Composite average sort) for Subjects Analyzed in this Set

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This program uses the data cards punched from Program #1. It will then calculate the Spearman rho (rank order correlation coefficient) by subject (up to 99 subjects). This measure describes how close the two sorts are related to each other. The value for correlation will be between +1.000 -1.000, with the +1 representing a perfect match between ideal and actual, and -1 being a perfect inverse match. Examples:

```
PERSON      1
RHO          .460

PERSON      2
RHO          .534

PERSON      3
RHO          .802
```

Person 1 has the highest correlation in this group. This measure is reported as the level of self-concept. More information on interpretation of scores is included elsewhere in this manual.

Following the list of correlation coefficients is given the mean and standard deviation for the group. NOTE: rank order correlation is a non-parametric statistic. This mixing produces values whose utility is only approximate.

The program goes on to calculate mean rank and standard deviation for each item, for this group sort. It then prints a group profile of the items in the sort, in the order that the group arranged them. This group profile requires an alphnumeric set of cards with the sort items punched on them. The data section of this program thus requires: a) number of sort items, b) alphanumeric listing of statements, and c) data cards from program #1

IDEAL

ORDER	ITEM NO.	MEAN RANK	DESCRIPTOR
1	7	4.00	IS ABLE TO APPLY WHAT IS LEARNED
2	16	4.18	COMPLETES ALL HOMEWORK
3	18	4.82	TAKES PART DURING DISCUSSIONS
4	2	5.00	THINKS UP OWN PROBLEMS TO INVESTIGATE
5	6	5.64	KNOWS THE MAIN IDEAS OF SCIENCE
6	1	7.00	READS ABOUT SCIENCE OUTSIDE OF CLASS
7	4	7.00	MEMORIZES A LOT OF NEW WORDS AND TERMS
8	10	7.36	WORKS AND SHARES WITH OTHER CLASSMATES
9	12	7.64	CONCERNED ABOUT GRADES
10	9	8.00	HELPS OTHER STUDENTS HAVING DIFFICULTY
11	14	8.45	RESPECTS TEACHERS OPINIONS
12	17	9.18	KEEPS ROOM AND EQUIPMENT NEAT AND CLEAN
13	15	14.00	LEARNS ONLY WHAT THE TEACHER ASKS FOR
14	11	15.00	NOT SELF CONFIDENT
15	13	15.00	COMPETES WITH CLASSMATES FOR TEACHERS ATTENTION
16	8	15.00	DOESNT FOLLOW TEACHER DIRECTIONS COMPLETELY
17	3	15.00	NEVER ASKS OWN QUESTIONS
18	5	17.00	DOESNT READ THE TEXTBOOK
19	19	18.00	CRITICIZES OTHER STUDENTS
20	20	19.09	DISRUPTS CLASS

PROGRAM #4: Comparison of Groups by Statement Items

This program enables comparison of up to 10 groups or classes on each item of both the ideal and the actual sort. Input is the cards from Program #3 (rearranged data cards). Significance of group differences is determined by use of a SPSS program which uses a non-parametric test for significance: the Kruskal-Wallis one-way analysis of variance. The results printout a significance test for each item, listing class number, number in class and mean rank. This is followed by total number of cases, chi-square value (corrected for ties) and level of significance.
Example:

- - - - - KRUSKAL-WALLIS 1-WAY ANOVA

Statement item #
C20
BY NC CLASS NUMBER

NC	0	1	2	3	4 → ... 9
NUMBER	11	13	0	0	0
MEAN RANK	14.8	10.5	0	0	0

CASES	CHI-SQUARE	SIGNIFICANCE	CORRECTED FOR TIES CHI-SQUARE	SIGNIFICANCE
24	2.1827	.1396	2.2174	.1365

If there is a preplanned expectation of difference such as in different treatment groups or with strong theoretical suggestion, a probability (p) level $< .05$ is con-

sidered significant. With this same alpha, 1 case out of 20 can be expected to show up a significant by chance; so, when just "fishing" a level of .05/n should be used to indicate significance (e.g., .05/20=.0025).

PROGRAM #1: Read Q-Sort Decks and Produce Punched Data Cards

This program reads the Q-sort decks after they have been sorted by subjects, and produces punched cards (one for ideal sort, one for actual sort per subject) as permanent records and for analysis with other programs. For example, person 1 will have two cards produced from his/her sort:

Person 01 1 13 21519 8 61110...., and Person 01 2 1916 3 91318

01 = Person; 1 = ideal; 13 21519 8 61110.... = order of statement items

01 = Person; 2 = actual; 1916 3 91318 = order of statement items

The Q-sort decks should be ordered by subject (1,2,3....) and alternate ideal followed by actual. The number of items (questions) in the sort should be entered on the first data card. This number can range from 1 to 38 statements.

P FORTRAN COMPILATION

```
      PROGRAM P(INPUT,OUTPUT,PUNCH,TAPE5=INPUT,TAPE7=PUNCH,TAPE6=OUTPUT)
C     THE MAXIMUM NUMBER OF QUESTIONS THIS PROGRAM CAN HANDLE IS 38
C     THE FIRST CARD MIST HAVE THE NUMBER OF QUESTIONS IN COLUMNS 1 AND 2
C     THE NEXT CARD HAS ON IT THE PERSON ID NUMBER IN COLUMNS 3 AND 4 AND
C     THE ACTUAL/IDEAL CODE IN COLUMN 6
C     THE PROGRAM THEN GOES THROUGH THE SUCCEEDING DATA CARDS AND COMBINES
C     THE NEXT NQ CARDS (NQ=NUMBER OF QUESTIONS) ON TO A SINGLE CARD.
C     IT READS THE FIRST 2 COLUMNS OF THE CARDS.
C     IT DOES NOT CHECK FOR THE PROPER NUMBER OR THE PROPER CODES.
C     AFTER IT HAS PUT NQ NUMBERS ONTO A SINGLE CARD (PLUS THE ID AND CODE ) IT
C     EXPECTS TO FIND A NEW PERSON CARD WITH CODE.
C     IT REPEATS THIS PROCESS WITH EACH SET OF NQ+1 CARDS
C     IT STOPS WHEN IT READS A PERSON ID WITH A VALUE OF -1.
000003        INTEGER ITEM(38)
000003        READ (5,20) NQ
000011     20 FORMAT(I2)
000011        IF (NQ.GT.38.OR.NQ.LT.1) GO TO 100
000021     10 CONTINUE
000021     60 READ (5,1001) IP,IA
000031   1001 FORMAT(2X,I2,1X,I1)
000031        IF (IP.EQ.-1) STOP
000035        DO 30 J=1,NQ
000037     30 READ (5,1000) ITEM(J)
000047   1000 FORMAT(I2)
000047        WRITE(7,1002)IP,IA,( ITEM(J),J=1,NQ)
000065   1002 FORMAT(I2,I1,1X,38I2)
000065        GO TO 10
000066    100 CONTINUE
000066        WRITE(6,105) NQ
000074    105 FORMAT(* THE NUMBER OF QUESTIONS ALLOWED MUST BE BETWEEN 1 AND *,
     1   /,* 38.  YOU HAVE *,I3,* PROGRAM IS STOPPING.*)
000074        STOP
000076        END
```

APPENDIX 1

SCIENCE STUDENT SORT ITEMS

1. Reads about science outside of class
2. Thinks up own problems to investigate
3. Never asks own questions
4. Memorizes a lot of new words and terms
5. Doesn't read the textbook
6. Knows the main ideas of science
7. Is able to apply what is learned
8. Doesn't follow teacher directions completely
9. Respects teacher's opinion
10. Learns only what the teacher asks for
11. Completes all homework
12. Disrupts class
13. Keeps room and equipment neat and clean
14. Takes part during discussion
15. Criticizes other students
16. Helps other students having difficulty
17. Works and shares with other classmates
18. Not self-confident
19. Concerned about grades
20. Competes with classmates for teacher's attention

APPENDIX 2

TEACHER BEHAVIOR SORT ITEMS

1. Acts at ease in the classroom, not nervous
2. Uses punishment to maintain control
3. Keeps an orderly classroom
4. Creates a comfortable learning atmosphere
5. Has students use self-evaluation
6. Gives questions in tests which require memorizing
7. Uses only test scores for grading
8. Gives problem solving questions in tests
9. Is disorganized
10. Shares teaching problems with other teachers
11. Works and talks often and well with other teachers
12. Acts like students are important as individuals
13. Talks with students about their personal problems
14. Quickly returns student work with comments or grades
15. Fills class time with work
16. Uses words students can't understand
17. Asks questions that make students think
18. Uses what students want in class design
19. Uses only one teaching approach
20. Encourages and responds to students' opinions and ideas
21. Follows school rules and procedures
22. Influences school policies outside the classroom
23. Initiates contact with parents and community members
24. Effectively gets across subject matter

APPENDIX 4

```
                PROGRAM PROFILE(INPUT,OUTPUT,PUNCH,TAPE5=INPUT,TAPE6=OUTPUT,
               1TAPE7=PUNCH)
      C     PROFILE HAS NOW BEEN COMBINED WITH QSORT AND GENERALIZED TO DEAL
      C     WITH ANY NUMBER OF QUESTIONS 38 OR LESS.
      C     WHAT IS CLOSE TO THE ORIGINAL QSORT IS SET APRT FROM WHAT IS CLOSE
      C     TO THE ORIGINAL PROFILE BY PAIRS OF C COMMENT CARDS
      C
      C     PLEASE NOTE THE FUNNY COMBINATION OF PARAMETRIC AND NON-PARAMETRIC
      C     STATISTICS.  ALSO NOTE THE AVERAGING OF RHO AND THE LACK OF A TIE
      C     CORRECTION FACTOR IN ITS CALCULATION.
      C
      C     THE INPUT IS... ON CARD 1 COLUMNS 1 AND 2 HAVE THE NUMBER OF
      C     QUESTIONS = NQ.    ON THE NEXT NQ CARDS IN COLUMNS 1 TO 75 GO THE
      C     NAMES OF THE QUESTIONS.    ON THE NEXT 2*M CARDS THE OUTPUT FROM P
      C     WHICH CONSISTS OF ALTERNATING CARDS OF IDEAL AND ACTUAL RATINGS WITH
      C     THE ID NUMBER IN COLUMNS 1 AND 2. (COLUMNS 3 AND 4 ARE NOT LOOKED
      C     AT) COLUMNS 5 TO (NQ+2)*2 HAVE THE QUESTION RANKINGS.
      C      THE PROGRAM ENDS WHEN IT ENCOUNTERS AN ID NUMBER EQUAL TO -1.
      C
000003          REAL KA(38),KASQ(38),ISD(38),ASD(38),KI(38),KISQ(38),
               1IBAR(38),ABAR(38)
000003          INTEGER ACT(38),IDL(38),ITEMI(38),HOLDI,ITEMA(38),HOLDA,
               :TEMPI,TEMPA
000003          DIMENSION BEHAV(38,13)
000003          READ(5,4)NQ
000011        4 FORMAT(I2)
000011          IF(NQ.GE.1.AND.NQ.LE.38) GO TO 41
000022          WRITE(6,42)NQ
000027       42 FORMAT(* PROGRAM IS STOPPING BECAUSE THE NUMBER OF QUESTIONS*,/,
               1*  MUST BE BETWEEN 1 AND 38 AND YOU HAD*,I3)
000027          STOP
000031       41 CONTINUE
000031          DO 601 I=1,NQ
000033      601 READ(5,1007) (BEHAV(I,J),J=1,13)
000051     1007 FORMAT(13A5)
000051          DO 220 K=1,NQ
000052          ITEMI(K)=K
000053      220 ITEMA(K)=K
000056          DO 5 J=1,NQ
000060          KI(J)=0.
000061          KA(J)=0.
000062          KISQ(J)=0.
000063          KASQ(J)=0.
000064          ISD(J)=0.
000065          ASD(J)=0.
000066          IBAR(J)=0.
000067          ABAR(J)=0.
000070        5 CONTINUE
000072          KNUM=0
      C
      C
000073          RK=0.
000074          RSUM=0.
000075          RSQ=0.
000076       10 READ (5,1000)ID,(IDL(I),I=1,NQ)
000113     1000 FORMAT(I2,2X,38I2)
000113          READ(5,1033)(ACT(I),I=1,NQ)
000126     1033 FORMAT(4X,38I2)
000126          IF (ID.EQ.-1) GO TO 600
      C
      C
000130          KNUM=KNUM+1
000132          K=0
000133          DO 30 I=1,NQ
000134          K=K+1
000136          KJ=0
000137          DO 20 J=1,NQ
000140          KJ=KJ+1
000142       15 IF(ACT(I).EQ.KJ) GO TO 25
000145       16 IF(IDL(I).EQ.KJ) GO TO 26
000150          GO TO 20
000150       25 KA(J)=KA(J)+K
000153          KASQ(J)=KASQ(J)+K*K
000156          GO TO 16
000157       26 KI(J)=KI(J)+K
000162          KISQ(J)=KISQ(J)+K*K
000165       20 CONTINUE
000170       30 CONTINUE
```

```
      C
      C
000172          DSUM=0.
000173          D=0.
000174          RK=RK+1.
000176          DO 630 I=1,NQ
000177          DO 620 J=1,NQ
000200          IF (IDL(I).EQ.ACT(J)) GO TO 625
000203      620 CONTINUE
000205      625 D=(I-J)*(I-J)
000211          DSUM=DSUM+D
000212      630 CONTINUE
000215          RHO=1.-(6.*DSUM/(NQ**3-NQ))
000223          WRITE(6,6001) ID ,RHO
000233     6001 FORMAT(1H0,3X,*PERSON*,4X,I2/4X,*RHO*,7X,F7.3)
000233          RSQ=RSQ+RHO*RHO
000236          RSUM=RSUM+RHO
      C
      C
000237          GO TO 10
      C
      C
000237      600 VAR=((RK*RSQ)-(RSUM*RSUM))/(RK*(RK-1.))
000246          SD=SQRT(VAR)
000250          RBAR=RSUM/RK
000252          WRITE(6,6002) RBAR,SD
000261     6002 FORMAT(1H0,*AVERAGE RHO IS*,1X,F7.3/1X,
            1*STANDARD DEVIATION OF RHO IS*,1X,F7.3)
      C
      C
000261          WRITE(6,1002)
000265     1002 FORMAT(1H1,20X,*IDEAL*//10X,*ITEM NO.*,3X,*MEAN RANK*,3X,
            1*STANDARD DEV.*)
000265          K=0
000266          DO 150 J=1,NQ
000270          K=K+1
000272          IBAR(J)=KI(J)/KNUM
000274          ISD(J)=SQRT((KNUM*KISQ(J)-KI(J)*KI(J))/(KNUM*(KNUM-1)))
000311      150 WRITE(6,1001) K,IBAR(J),ISD(J)
000326     1001 FORMAT(1H0,12X,I2,8X,F5.2,9X,F5.2)
000326          WRITE(6,1004)
000331     1004 FORMAT(1H0,20X,*ACTUAL*//10X,*ITEM NO.*,3X,*MEAN RANK*,3X,
            1*STANDARD DEV.*)
000331          K=0
000332          DO 200 J=1,NQ
000334          K=K+1
000336          ABAR(J)=KA(J)/KNUM
000340          ASD(J)=SQRT((KNUM*KASQ(J)-KA(J)*KA(J))/(KNUM*(KNUM-1)))
000355      200 WRITE(6,1003) K,ABAR(J),ASD(J)
000372     1003 FORMAT(1H0,12X,I2,8X,F5.2,9X,F5.2)
000372          NQM1=NQ-1
000374          DO 300 J=1,NQM1
000375          MI=J
000376          MA=J
000377          MK=J+1
000401          DO 250 I=MK,NQ
000402          IF(IBAR(I).LT.IBAR(MI))MI=I
000406      250 IF(ABAR(I).LT.ABAR(MA)) MA=I
000415          TEMPI=IBAR(J)
000417          IBAR(J)=IBAR(MI)
000421          IBAR(MI)=TEMPI
000423          HOLDI=ITEMI(J)
000425          ITEMI(J)=ITEMI(MI)
000427          ITEMI(MI)=HOLDI
000430          TEMPA=ABAR(J)
000432          ABAR(J)=ABAR(MA)
000434          ABAR(MA)=TEMPA
000436          HOLDA=ITEMA(J)
000440          ITEMA(J)=ITEMA(MA)
000442      300 ITEMA(MA)=HOLDA
000446          WRITE(6,1005)
000451     1005 FORMAT(1H1,20X,*IDEAL*//3X,*ORDER*,2X,*ITEM NO.*,3X,*MEAN RANK*,
            115X,*DESCRIPTOR*/)
000451          DO 500 J=1,NQ
000453          L=ITEMI(J)
000455      500 WRITE(6,1006) J,ITEMI(J),IBAR(J),(BEHAV(L,I),I=1,13)
000501     1006 FORMAT(1H ,4X,I2,6X,I2,8X,F5.2,9X,13A5)
000501          WRITE(6,1008)
000504     1008 FORMAT(1H1,20X,*ACTUAL*//3X,*ORDER*,2X,*ITEM NO.*,3X,*MEAN RANK*,
            115X,*DESCRIPTOR*/)
000504          DO 800 J=1,NQ
000506          L=ITEMA(J)
000510      800 WRITE(6,1006) J,ITEMA(J),ABAR(J),(BEHAV(L,I),I=1,13)
000534          STOP
```

Program #3: Rearrange Data to Ranking by Statement Item, BY CLASSES for Comparison

This program takes the data cards (statement rankings by subject) and converts information to rankings of each item statement by all subjects for a given class. Limits: 10 classes, 99 subjects per class. The classes can, of course, be actual school classes or groups for comparison. e.g., males vs. females, student teachers vs. experienced teachers, pre- and post measures, or grade levels. The output is punched cards which can then be analyzed in the following program #4. This program produces no analysis by itself.

```
REARNG   FORTRAN COMPILATION

                PROGRAM REARNG(INPUT,OUTPUT,PUNCH,TAPE5=INPUT,TAPE6=OUTPUT,
               1 TAPE7=PUNCH)
      C     THIS PROGRAM GOES THROUGH EACH STUDENTS RESPONCES AND REORDERS
      C     THEM BY RANK INSTEAD OF BY QUESTION.  IT TAKES AS INPUT THE OUTPUT
      C   OF P WITH THE ADDITION THAT AT THE END OF EVERY CLASS AN ID OF -1 IS
      C     PUT TO IDENTIFY THE END OF THE CLASS EXCEPT FOR THE VERY LAST CLASS
      C     WHICH MUST BE ENDED WITH A -2.  PRECEEDING THE P OUTPUT MUST GO A
      C     CARD WITH THE NUMBER OF QUESTIONS IN COLUMNS 1 AND 2.
      C
      C     THE OUTPUT IS JUST AS THE INPUT  EXCEPT THAT COLUMN 4 HAS THE CLASS
      C     NUMBER AND OF COURSE THE RANKINGS ARE NOW OUTPUT BY QUESTION NUMBER.
000003          DIMENSION RAT(38),RQ(38)
000003          INTEGER RAT,RQ
000003          NC=0
000004          READ(5,2)NQ
000012        2 FORMAT(I2)
000012          IF(NQ.LE.38.AND.NQ.GE.1) GO TO 10
000023          WRITE(6,5)NQ
000030        5 FORMAT(* NQ OUT OF 1 TO 38 ALLOWED RANGE. PROGRAM ABORTING. NQ=*
               1,I2)
000030          STOP
      C
000032          WRITE(6,50)(I,I=1,NQ)
000044       50 FORMAT(5X,*ID#,4X,*I/A*,3X,*CLASS*,2X,38(1X,I2))
000044       10 CONTINUE
000044          READ(5,15)ID,IA,(RAT(I),I=1,NQ)
000063       15 FORMAT(I2,I1,1X,38I2)
000063          IF(ID.EQ.-1)NC=NC+1
000067          IF(ID.EQ.-1) GO TO 10
000070          IF(ID.EQ.-2)STOP
000074          DO 30 J=1,NQ
000076          DO 20 I=1,NQ
000077          IF(J.EQ.RAT(I)) GO TO 25
000101       20 CONTINUE
000103          WRITE(6,22)
000107       22 FORMAT(* ERROR. COULD NOT FIND A RANKING. PROGRAM STOPPING.*)
000107          STOP
      C
000111       25 RQ(J)=I
000113       30 CONTINUE
000116          WRITE(7,40)ID,IA,NC,(RQ(I),I=1,NQ)
000136       40 FORMAT(I2,2I1,38I2)
000136          WRITE(6,45)ID,IA,NC,(RQ(I),I=1,NQ)
000157       45 FORMAT(5X,I2,5X,I1,5X,I1,5X,38(I2,1X))
000157          GO TO 10
000160          END
```

PROGRAM #4

```
VOGELBACK COMPUTING CENTER
NORTHWESTERN UNIVERSITY

S P S S - - STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES

VERSION 7.0 - - JUNE 27, 1977

U. C. BERKELEY COMPUTER CENTER RELEASE - - DEC 1, 1977


     RUN NAME          FOR EACH QUESTION ARE THE CLASSES DIFFERENT
     VARIABLE LIST     ID,IA,NC,Q1 TO Q38
     INPUT FORMAT      FIXED(F2.0,2F1.0,38F2.0)

     N OF CASES        UNKNOWN
     MISSING VALUES    ID, IA (0) Q1 TO Q38 (0)
     VALUE LABELS      IA (1) IDEAL (2) ACTUAL
     VAR LABELS        ID, ID NUMBER/IA, IDEAL ACTUAL/NC,CLASS NUMBER
     #SELECT IF        (IA EQ 1)
     NPAR TESTS        K-W=Q1 TO Q38 BY NC(0,9)
     READ INPUT DATA
```

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